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IN THE CLAIMS

Please amend claims 1, 8, 11-13, 15-18, 23, 25-26, and 28-32 as follows below.

Please cancel claims 7, 20-22, and 33-61 without prejudice.

Please add new claims 62-77 as follows below.

The following listing of claims replaces all prior versions, and listings, of claims in the application:

MARKED UP VERSION OF PENDING CLAIMS

1 1. (Currently Amended) An apparatus comprising:
2 a data alignment device including
3 a plurality of input channels to receive a stream
4 of input characters;
5 a control code detector coupled to the plurality
6 of input channels to detect the occurrence of an
7 aligning character in each input channel;
8 a plurality of buffers, each buffer coupled to one
9 input channel to store the input characters received
10 over that input channel;
11 a plurality of output channels, each output
12 channel coupled to one buffer and to a corresponding
13 input channel to transmit a stream of characters from
14 the corresponding buffer; and
15 a control unit coupled to the control code
16 detector and buffers, and configured to monitor the
17 occurrence of an aligning character in each input
18 channel, to hold the aligning character and
19 subsequently received input characters for each input

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20 channel in the corresponding buffer until an aligning
21 character has been detected on every input channel,
22 then resume transmissions over all of the output
23 channels starting with each aligning character on the
24 corresponding buffers and then the subsequently
25 received input characters in the order in which they
26 were received,
27 wherein the control unit to stop holding the
28 aligning character and subsequently received input
29 characters for each input channel in the corresponding
30 buffer if an aligning character has not been detected
31 on every input channel within a given period of time
32 from the first detected aligning character.

1 2. (Original) The apparatus of claim 1 wherein
2 the control unit is configured to generate filler
3 characters and transmit them over those output channels
4 where an aligning character has been detected on its
5 corresponding input channel.

1 3. (Original) The apparatus of claim 1 wherein
2 the control unit to stop generating and transmitting
3 the filler characters once an aligning character has been
4 detected on every input channel.

1 4. (Original) The apparatus of claim 1 wherein
2 the plurality of buffers are configured as first-in,
3 first-out stacks.

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1 5. (Original) The apparatus of claim 1 wherein
2 transmissions over the plurality of output channels
3 includes digital transmissions.

1 6. (Original) The apparatus of claim 1 further comprising:
2 an output clock to transmit one character over each
3 output channel on each clock cycle.

1 7. (Cancelled)

1 8. (Currently Amended) An [[The]] apparatus of claim 1
2 comprising:
3 a data alignment device including
4 a plurality of input channels to receive a stream
5 of input characters;
6 a control code detector coupled to the plurality
7 of input channels to detect the occurrence of an
8 aligning character in each input channel;
9 a plurality of buffers, each buffer coupled to one
10 input channel to store the input characters received
11 over that input channel;
12 a plurality of output channels, each output
13 channel coupled to one buffer and to a corresponding
14 input channel to transmit a stream of characters from
15 the corresponding buffer; and
16 a control unit coupled to the control code
17 detector and buffers, and configured to monitor the
18 occurrence of an aligning character in each input

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19 channel, to hold the aligning character and
20 subsequently received input characters for each input
21 channel in the corresponding buffer until an aligning
22 character has been detected on every input channel,
23 then resume transmissions over all of the output
24 channels starting with each aligning character on the
25 corresponding buffers and then the subsequently
26 received input characters in the order in which they
27 were received, wherein the control unit stops holding
28 the aligning character and subsequently received input
29 characters for each input channel in the corresponding
30 buffer if an aligning character has not been detected
31 on every input channel within a given number of
32 characters from the first detected aligning character.

1 9. (Original) The apparatus of claim 1 wherein
2 the aligning character is the character /A/.

1 10. (Original) The apparatus of claim 1 wherein
2 the filler character is the character /R/.

1 11. (Currently Amended) An ~~[[The]]~~ ~~apparatus of claim 1~~
2 ~~further~~ comprising:
3 a data alignment device including
4 a first plurality of input channels to receive a
5 stream of input characters,
6 a control code detector coupled to the plurality
7 of input channels to detect the occurrence of an
8 aligning character in each input channel,

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9 a plurality of buffers, each buffer coupled to one
10 input channel to store the input characters received
11 over that input channel,
12 a first plurality of output channels, each output
13 channel coupled to one buffer and to a corresponding
14 input channel to transmit a stream of characters from
15 the corresponding buffer, and
16 a first control unit coupled to the control code
17 detector and buffers, and configured to monitor the
18 occurrence of an aligning character in each input
19 channel, to hold the aligning character and
20 subsequently received input characters for each input
21 channel in the corresponding buffer until an aligning
22 character has been detected on every input channel,
23 then resume transmissions over all of the output
24 channels starting with each aligning character on the
25 corresponding buffers and then the subsequently
26 received input characters in the order in which they
27 were received;
28 and
29 a rate matching device including
30 a second plurality of input channels coupled to
31 the plurality of output channels of the data alignment
32 device to receive the output stream of characters from
33 the data alignment device, [[;]]
34 a buffer coupled to the plurality of input
35 channels to store the characters received over the
36 input channels of the rate matching device, [[;]]

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37 a second plurality of output channels coupled to
38 the buffer and each output channel corresponding to one
39 input channel of the rate matching device to transmit a
40 stream of characters from the buffer, [[;]] and
41 a second control unit coupled to the buffer and
42 configured to control the transmission of characters
43 from the buffer, insert a filler character if an
44 underflow condition is detected, and remove a filler
45 character if an overflow condition is detected.

1 12. (Currently Amended) The apparatus of claim 11 further
2 comprising:
3 a data counter to monitor the number of data stored in
4 the ~~rate matching~~ buffer of the rate matching device at any
5 one time.

1 13. (Currently Amended) The apparatus of claim 11 wherein
2 the buffer of [[for]] the rate matching device is
3 configured as a first-in, first-out buffer stack with six
4 storage elements.

1 14. (Original) The apparatus of claim 11 further
2 comprising:
3 a control code detector for the rate matching device
4 coupled to the plurality of input channels to detect the
5 occurrence of an aligning character in each input channel
6 for the rate matching device before initiating the
7 transmission of characters from the buffer.

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1 15. (Currently Amended) The apparatus of claim 11 wherein
2 the second control unit of ~~[[for]]~~ the rate matching
3 device only removes or inserts the filler character during
4 the interval between two data packets.

1 16. (Currently Amended) The apparatus of claim 11 wherein
2 the buffer of ~~[[for]]~~ the rate matching device
3 comprises one buffer for each input channel to the rate
4 matching device.

1 17. (Currently Amended) The apparatus of claim 11 wherein
2 the second control unit of the rate matching device
3 does not begin to transmit characters from the rate matching
4 buffer until a plurality of characters have been stored in
5 the rate matching buffer.

1 18. (Currently Amended) The apparatus of claim 11 wherein
2 the transmission of characters from the buffer of the
3 rate matching device ~~buffer~~ is synchronous over all output
4 channels for the rate matching device.

1 19. (Original) The apparatus of claim 11 wherein
2 the apparatus comprises an integrated circuit device.

1 20-22. (Cancelled)

1 23. (Currently Amended) A ~~[[The]]~~ method ~~of claim 20~~
2 ~~further~~ comprising:

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3 aligning one or more transmission channels including,
4 detecting the occurrence of an aligning character
5 in a plurality of input channels;
6 stalling the retransmission of the aligning
7 character and the subsequently received
8 characters for each transmission channel where
9 an aligning character has been received until an
10 aligning character has been detected on every
11 input channel;
12 buffering the aligning character and subsequently
13 received characters for each input channel in a
14 buffer until an aligning character has been
15 detected on every input channel; and
16 transmitting the stalled characters, starting with
17 the aligning characters and continuing with the
18 subsequently received characters once an
19 aligning character has been received on every
20 input channel.

1 24. (Original) The method of claim 23 further
2 comprising:
3 resetting the buffer if an aligning character is not
4 detected in every input channel within a maximum number of
5 characters from the first received aligning character in any
6 input channel.

1 25. (Currently Amended) The method of claim [[20]] 23
2 wherein

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3 the aligning character is the character /A/.

1 26. (Currently Amended) The method of claim [[20]] 23
2 further comprising:

3 transmitting one or more filler characters over an
4 output channel corresponding to an input channel on which an
5 aligning character has been detected until an aligning
6 character has been detected in every input channel.

1 27. (Original) The method of claim 26 wherein
2 the filler character is the character /R/.

1 28. (Currently Amended) A [[The]] method ~~of claim 20~~
2 ~~further~~ comprising:
3 matching the transmission rates of a first clock to the
4 transmission rates of a second clock including,
5 receiving one or more characters over a plurality
6 of input channels synchronized by the first
7 clock, [[;]]
8 buffering the one or more characters received;
9 transmitting the one or more buffered characters
10 over one or more output channels synchronized by
11 the second clock, [[;]]
12 inserting a filler character in each output
13 channel if an underflow condition is detected,
14 [[;]] and
15 removing a filler character in each output channel
16 if an overflow condition is detected; and
17 aligning one or more transmission channels including,

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18 detecting the occurrence of an aligning character
19 in the plurality of input channels;
20 stalling the retransmission of the aligning
21 character and the subsequently received
22 characters for each transmission channel where
23 an aligning character has been received until an
24 aligning character has been detected on every
25 input channel; and
26 transmitting the stalled characters, starting with
27 the aligning characters and continuing with the
28 subsequently received characters once an
29 aligning character has been received on every
30 input channel.

1 29. (Currently Amended) The method of claim 28 wherein
2 the matching of the transmission rates further
3 includes, ~~comprises:~~
4 awaiting the synchronous detection of an aligning
5 character in each input channel before
6 initiating the transmission of the one or more
7 buffered characters ~~from the buffer.~~

1 30. (Currently Amended) The method of claim 28 wherein
2 in matching the transmission rates, the removing and
3 the inserting of the filler character only occurs during the
4 interval between two data packets.

1 31. (Currently Amended) The method of claim 28 wherein

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2 the transmission of the one or more buffered characters
3 does not begin until a plurality of characters have been
4 buffered.

1 32. (Currently Amended) The method of claim 28 wherein
2 the transmission of the one or more buffered characters
3 is synchronous over all of the one or more output channels
4 ~~for the rate matching device.~~

1 33-61. (Cancelled)

1 62. (New) The apparatus of claim 8 wherein
2 the control unit is configured to generate filler
3 characters and transmit them over those output channels
4 where an aligning character has been detected on its
5 corresponding input channel.

1 63. (New) The apparatus of claim 8 wherein
2 the control unit to stop generating and transmitting
3 the filler characters once an aligning character has been
4 detected on every input channel.

1 64. (New) The apparatus of claim 8 wherein
2 the plurality of buffers are configured as first-in,
3 first-out stacks.

1 65. (New) The apparatus of claim 8 wherein
2 transmissions over the plurality of output channels
3 includes digital transmissions.

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1 66. (New) The apparatus of claim 8 further comprising:
2 an output clock to transmit one character over each
3 output channel on each clock cycle.

1 67. (New) The apparatus of claim 8 wherein
2 the aligning character is the character /A/.

1 68. (New) The apparatus of claim 8 wherein
2 the filler character is the character /R/.

1 69. (New) The apparatus of claim 8 wherein
2 the apparatus comprises an integrated circuit device.

1 70. (New) The method of claim 23 wherein
2 first received characters are transmitted first.

1 71. (New) The method of claim 23 wherein
2 transmitting the stalled characters comprises
3 transmitting synchronously over all output
4 channels.

1 72. (New) The method of claim 28 further comprising:
2 resetting the buffer if an aligning character is not
3 detected in every input channel within a maximum number of
4 characters from the first received aligning character in any
5 input channel.

1 73. (New) The method of claim 28 wherein

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2 the aligning character is the character /A/.

1 74. (New) The method of claim 28 further comprising:
2 transmitting one or more filler characters over an
3 output channel corresponding to an input channel on which an
4 aligning character has been detected until an aligning
5 character has been detected in every input channel.

1 75. (New) The method of claim 74 wherein
2 the filler character is the character /R/.

1 76. (New) The method of claim 28 wherein
2 first received characters are transmitted first.

1 77. (New) The method of claim 28 wherein
2 transmitting the stalled characters comprises
3 transmitting synchronously over all output
4 channels.